

What is claimed is:

1. A system for tracking articles in a manufacturing environment comprising:  
a plurality of identification cards attached to said articles, said identification cards  
including memory and wireless connections for transmitting information about said  
5 articles;

a portable reader wand with memory and a wireless connection for transmitting  
information about said articles to and from said identification cards;

a central computer with a database of information about said articles; and

an interruptible connection between said portable reader wand and said central  
10 database for transmitting information about said articles.

2. The system of claim 1 wherein said connection between said portable reader wand  
and said central database includes an adapter to which said reader wand can be  
removably connected.

3. The system of claim 2 wherein said adapter comprises a cradle in which said  
15 reader wand rests when connected to said central computer.

4. The system of claim 1 wherein said central computer includes a network and said  
connection between said portable reader wand and said central database includes a  
connection over said network.

5. The system of claim 1 further comprising a reader/writer with memory and a  
20 wireless connection for transmitting information about said articles to and from said  
identification cards wherein said reader/writer is located at a fixed position and is  
permanently connected to said central database.

6. The system of claim 5 wherein said central computer includes a network and said connection between said portable reader wand and said central database and said connection between said reader/writer and said central database include connections over said network.

7. The system of claim 6 comprising a plurality of said reader wands and a plurality of said reader/writers each of which is connected to said central database over said network.

8. The system of claim 1 wherein said reader wand comprises a keypad for an operator to input information and a display screen for an operator to read information.

9. The system of claim 8 wherein said central computer comprises an operator interface and wherein system programming is performed at said central computer and said keypad on said reader wand is only used to select functions that were previously programmed at said central computer.

10. The system of claim 5 wherein both said reader wand and said reader/writer comprise a keypad for an operator to input information and a display screen for an operator to read information.

11. The system of claim 10 wherein said central computer comprises an operator interface and wherein system programming is performed at said central computer and said keypads on said reader wand and said reader/writer are only used to select functions that were previously programmed at said central computer.

12. The system of claim 11 wherein the keypad on said reader/writer includes greater capability for operator input than the keypad on said reader wand.

13. The system of claim 1 wherein said information about said articles includes information about manufacturing processes that have been performed on said articles.

14. The system of claim 13 wherein said information about said articles includes information about manufacturing processes that are scheduled to be performed on said  
5 articles.

15. The system of claim 14 wherein said information about said articles can be modified in said identification cards, said reader wand, or said central database at an intermediate time between performance of various manufacturing processes.

16. The system of claim 1 wherein said manufacturing environment is a  
10 semiconductor wafer manufacturing environment and said articles are wafer carriers.

17. The system of claim 16 wherein said information about said articles comprises information about the wafers carried in said wafer carriers.

18. The system of claim 17 wherein said information about the wafers carried in said wafer carriers includes information about manufacturing processes that have been  
15 performed on said wafers.

19. The system of claim 18 wherein said information about said wafers includes information about manufacturing processes that are scheduled to be performed on said wafers.

20. The system of claim 19 wherein said information about said wafers can be  
20 modified in said identification cards, said reader wand, or said central database at an intermediate time between performance of various manufacturing processes.

21. The system of claim 20 wherein modification of said information about said wafers results in a different design of semiconductor wafer being manufactured.

22. A method for tracking semiconductor wafers in a manufacturing environment comprising the steps of:

providing a plurality of wafer carriers with identification cards attached thereto wherein said identification cards include memory;

5 providing a portable reader wand with memory and with wireless communication capabilities for transmitting information to and from said identification cards;

providing a central database of information about said wafer carriers;

transmitting information from said central database to the memory in said portable reader;

10 disconnecting said portable reader wand from said central database;

transmitting information from the memory in said portable reader wand to the memory in said identification cards;

transmitting information from the memory in said identification cards to the memory in said portable reader wand;

15 reconnecting said portable reader wand to said central database; and

transmitting information from the memory in said portable reader wand to said central database.

23. The method of claim 22 wherein the step of transmitting information from said portable reader wand to said identification cards further comprises the step of

20 transmitting power from said portable reader wand to said identification card.

24. The method of claim 23 wherein said step of transmitting information from said identification cards to said portable reader wand further comprises the step of transmitting power from said portable reader wand to said identification card.

25. The method of claim 23 wherein the step of transmitting information from said portable reader wand to said identification cards comprises passing said portable reader wand within a distance of less than 100 mm from said identification cards.

26. The method of claim 22 further comprising the steps of:

5 providing a stationary reader/writer with memory and with wireless communication capabilities for transmitting information to and from said identification cards;

transmitting information from said central database to the memory in said reader/writer;

10 transmitting information from the memory in said reader/writer to the memory in said identification cards;

transmitting information from the memory in said identification cards to the memory in said reader/writer;

15 transmitting information from the memory in said reader/writer to said central database.

27 A method of identifying a specific wafer carrier within a semiconductor manufacturing environment comprising the steps of:

providing a plurality of wafer carriers with identification cards attached thereto wherein said identification cards include memory;

20 providing a portable reader wand with memory and with wireless communication capabilities for transmitting information to and from said identification cards;

providing a central database of information about said wafer carriers;

transmitting information from said central database to the memory in said  
portable reader wherein said information uniquely identifies said specific wafer carrier;  
disconnecting said portable reader wand from said central database;  
transmitting information from the memory in said portable reader wand to the  
5 memory in said identification cards;  
transmitting information from the memory in said identification cards to the  
memory in said portable reader wand;  
generating a visual or audible signal when the information transmitted from the  
memory in one of said identification cards indicates that it is attached to said specific  
10 wafer carrier.

28. The method of claim 27 wherein the step of transmitting information from said  
portable reader wand to said identification cards further comprises the step of  
transmitting power from said portable reader wand to said identification card.

29. The method of claim 27 wherein said step of transmitting information from said  
15 identification cards to said portable reader wand further comprises the step of  
transmitting power from said portable reader wand to said identification card.

30. The method of claim 27 wherein the step of transmitting information from said  
portable reader wand to said identification cards comprises passing said portable reader  
wand within a distance of less than 100 mm from said identification cards.